Chapter 12
Aesthetics, Light, and Glare

This chapter is based on the Aesthetics Technical Report, which is included as Appendix K to this Final EIS. The Aesthetics Technical Report includes the full set of photographs and visual renderings of the proposed project, a portion of which are included in this chapter.

12.1 Existing Conditions

12.1.1 Aesthetics

12.1.1.1 Existing Visual Character

Area Context

The aesthetic character of the Upper Snoqualmie Valley is typified by river floodplains, upland plateaus and the foothills of the Cascade Mountains. Mount Si, Mount Washington, Mailbox Peak, and Rattlesnake Ridge rise dramatically from the river lowlands and visually define the Upper Snoqualmie Valley as the gateway between the Cascade Mountains and the Puget Sound lowlands.

Historically, the aesthetic character of the built environment of the Upper Snoqualmie Valley was typically forest and small town in nature, with a more recent trend toward suburban-style development. The rivers and forested hillsides and mountains of the area are also used extensively for recreation.

Sites

Overall, the visual character of the proposed project sites is of a forested area with some bare ground on the Lower Site. The Lower Site is at the base of Grouse Ridge, at approximately Elevation 690, and contains a former gravel mining operation. The Upper Site is at the top of Grouse Ridge, at approximately Elevation 1,600. Both sites, and the adjacent area to the east, are used for timber production. Most of the forested area on the sites has been logged and is in various stages of new tree growth.

Primary Viewer Groups and Selected Viewpoints

The primary viewer groups in the area of the Upper and Lower Sites are the following:

- Motorists using I-90 as the freeway approaches and passes adjacent to the sites
- Motorists using area roadways, including SE North Bend Way
- Residents in the immediate vicinity, including those along SE 144th Street, Middle Fork Road SE, SE Lake Dorothy Road, and SE 153rd Street
- The Lu residence
- Residents farther from the sites, including those residing in the Uplands residential development

Another potential viewer group includes recreational users at viewpoints on the numerous trails in the vicinity. The greatest number of viewers of the sites are from I-90 and Mount Si.

Photographs were taken from locations representative of the primary viewer groups and locations where views could be most affected by proposed mining and processing. Figure 12-1 illustrates the viewpoint locations.

Views to the Site

The sites are visible from near the summit of Mount Si (Viewpoint 1) in the Mount Si Natural Resources Conservation Area. A panoramic view of the Upper Snoqualmie Valley is available from this viewpoint. Prominent features of this view include residential and commercial development in the valley floor, I-90, Grouse Ridge, and several peaks of the Cascade Mountains. From this viewpoint, both the top and sides of Grouse Ridge are clearly visible, and the patchwork of clearcut and forest plantation areas indicative of forest management is evident. The existing surface mine area on the Lower Site is also visible but is not visually prominent. About 72,000 people visited Mount Si in 2000.

From the Uplands residential development (Viewpoint 2), a forested hillside is prominent in the foreground, with the western slope of Grouse Ridge and Mailbox Peak visible in the background. The top of Grouse Ridge and the Lower Site are not visible.

From a representative viewpoint from residences along SE Middle Fork Road and SE Lake Dorothy Road and Vallley Camp (Viewpoint 3), the northern slope of Grouse Ridge, filtered by deciduous vegetation, is visible (the top of Grouse Ridge is not visible from this viewpoint). Mount Washington is prominent in the background.

From homes north of the Lower Site, across SE 144th Street, (Hahn residence - Viewpoint 4), the overall character of the existing views from

this residence is of forested valley and hillsides. From the Hahn residence, filtered views of the vegetated portion of the Lower Site and the western slope of Grouse Ridge are available. Partial views of Mount Washington and I-90 are visible in the background.

From eastbound on SE North Bend Way (Viewpoint 5) views of the eastbound and westbound lanes of I-90, grass and forested areas between SE North Bend Way and I-90, and vegetation between the eastbound and westbound lanes of I-90 are prominent in the foreground. The west slope of Grouse Ridge is prominent in the background. Mailbox Peak is also partially visible. The overall character of this view is of roadways surrounded by forest.

From eastbound I-90 (Viewpoint 6), the overall character of this view is of roadway with forested hillside and mountains beyond. From this viewpoint, the I-90 roadway is prominent in the foreground, with the western slope of Grouse Ridge prominent in the background. The upper portion of Mailbox Peak is also visible in the foreground. There are about 26,000 vehicle trips per day on I-90 east of North Bend.

Viewpoints 5 and 6 are also representative of views from Camp Waskowitz, southwest of Exit 34 on the South Fork of the Snoqualmie River.

From the intersection of 153rd Street/470th Place SE (Viewpoint 7), views are of the roadway, improvements to residential lots (such as fences and rockeries), and forest area in the foreground. Portions of the western slope of Grouse Ridge and Mailbox Peak are prominent in the background. The overall character of this view is of rural residential uses surrounded by forest, hillside, and mountains.

From westbound I-90 (Viewpoint 8), views are of a portion of the previous mining area on the Lower Site, the Lu residence, and Mount Si. Views to the majority of the Lower Site are obscured by deciduous vegetation along the northern edge of I-90. In general, this viewpoint affords a panoramic view of a portion of the Upper Snoqualmie Valley and Mount Si. This section of westbound I-90 acts as a visual gateway between the Cascade Mountains and the Puget Sound lowlands.

The section of the Iron Horse Trail traversing the northern slope of Mount Washington (Viewpoint 9) provides views of Mount Si and a small portion of the Upper Snoqualmie Valley. The Lower Site and Grouse Ridge are not visible from this viewpoint. About 200,000 people visited this trail in 2000.

From the Lu residence, the second floor of the main residence building (Viewpoint 10) provides views of the Lu residence grounds, vegetated portions of the Lower Site, portions of the western slope of Grouse Ridge, a small glimpse of I-90, and Mount Washington. From the grounds of the Lu residence (Viewpoint 11), the western slope of Grouse Ridge, vegetated portions of the Lower Site, a portion of I-90, and Mount

Washington are visible. The overall character of views from the Lu residence to the south is forested valley, hillsides, and mountains.

Viewpoint 12, also from the Lu residence, provides views of forested area, the existing mining area on the Lower Site, and I-90 in the foreground. Mount Washington and Rattlesnake Ridge are visible in the background. The Upper Site is not visible from this viewpoint.

From I-90, south and east of the Upper Site (Viewpoint 13), the overall character of the view is of roadway with the forested southern ridge of Grouse Ridge beyond. A portion of the Homestead Valley mine is also visible.

From the Iron Horse Trail (Viewpoint 14), south and east of the Upper Site, the forested southern slope of Grouse Ridge and the Homestead Valley mine dominate the view. A distant view of Mount Si is also afforded.

From near the summit of Mailbox Peak (Viewpoint 15), a panoramic view of the Snoqualmie Valley is afforded. The Washington State Patrol Fire Training Academy and the top of Grouse Ridge (Upper Site) are prominent in the foreground. Mt. Washington, I-90, the valley floor, and Rattlesnake Ridge dominate the background.

A representative view of the proposed conveyor alignment from SE 144th Street is provided at Viewpoint 16. From this viewpoint, the forested western slope of Grouse Ridge is prominent in the foreground, with Mailbox Peak visible in the background.

From the Snoqualmie Point Overlook (Viewpoint 17), the grass amphitheater, stage, and tree-line dominate the foreground. Mt. Si, Mailbox Peak, and the Cascade Range are prominent in the background. I-90, the western slope of Grouse Ridge, and the area of the Lower Site are also visible in the background.

12.1.2 Light and Glare

12.1.2.1 Existing Lighting Conditions

Lighting conditions in the area vary considerably, with I-90 and the auto-oriented commercial area along 468th Avenue SE containing a relatively high level of lighting and areas north and east of the commercial area (including the sites) containing a relatively low light level.

Lighting sources on I-90 include pole-mounted lighting at Exits 32 and 34, pole-mounted lighting along I-90 approximately 0.25 mile east of both exits, two electronic reader signs, and motorist headlights. Lighting sources associated with the auto-oriented commercial area include pole-mounted street lighting on 468th Avenue SE, illuminated business signs, building lighting, and numerous pole-mounted parking lot lights (the parking lot lighting does not include cutoffs to direct light to the parking

area and limit lighting to surrounding areas). The level of lighting at this commercial area is relatively high, and it is the major light source in the area. Other sources of light in the area west of 468th Avenue SE include business lighting along SE North Bend Way and street lighting along limited portions of SE 140th Street.

The area east of 468th Avenue SE, including the Lower and Upper Sites, is rural in character with limited sources of light. The primary sources of light in the area include courtyard lighting at the Lu residence (globe lights approximately 8 feet high), security lighting associated with an outdoor storage business on SE Middle Fork Road (just east of 468th Avenue SE), dispersed residential yard and house lighting, and yard lighting at Vallley Camp. Light associated with the Fire Training Academy is not readily visible from lower elevation areas in the vicinity.

The Lower and Upper Sites are undeveloped and contain no sources of light. The limited light sources in the vicinity of the sites results in outstanding views of the nighttime sky on clear nights.

To provide a general quantification of existing lighting levels in the area, light levels were measured on May 7, 2001, using a Hagner Model EC1 light meter. The measurements were taken at ground level at various distances from the light source. For example, street lighting along SE Middle Fork Road measured 0.8 foot-candle directly under the street light and decreased to 0.0 as the meter moved away from the source (street lighting measures 0.0 at a distance of approximately 3 to 4 times street light height). Light sources closer to ground level tend to measure a higher light level than sources located above ground level. Light levels are measured in terms of foot-candles. A foot-candle is defined as "a unit of illumination, equivalent to the illumination produced by a source of one candle at a distance of one foot." The results of the light level measurements are provided in Table 12-1. A range shows light levels when the meter records light at different locations.

Table 12-1
Light Level Measurements in Proposed Project Area

Location	Light Source	Light Level (foot-candle range)
Auto Truck Plaza	Parking Lot	0.2 to 5.0
	Fuel Pump Dispensing	30
76 Station	Parking Lot	2.0 to 5.0
SE 146th Street	Fuel Pump Dispensing	90
SE 146th Street	Street Lighting	0.0 to 1.2
SE Middle Fork Road	Street Lighting	0.0 to 0.8
I-90 Ramp	Street Lighting	0.0 to 1.0

The Lower and Upper Sites are undeveloped and contain no sources of light. The limited light sources in the vicinity of the sites results in outstanding views of the nighttime sky on clear nights.

12.1.2.2 Existing Glare Conditions

The sites are currently undeveloped, with no sources of glare. Limited glare in the area is currently generated by buildings associated with the commercial area along 468th Avenue SE, residential structures, and automobiles using I-90 and other area roads.

12.2 Environmental Impacts

12.2.1 Construction Impacts

12.2.1.1 Alternative 1–No Action

Under Alternative 1, no construction activity would occur on the site. Future harvesting of trees on the site would occur. Compared to the Proposal, visual impacts from harvesting would be similar to those anticipated from clearing of land prior to commencement of mining.

12.2.1.2 Alternative 2–Proposal: Lower and Upper Sites Mining (Including Limited Lower Site Mining)

Phased clearing of portions of the Lower and Upper Sites would result in clearcut-like areas on the sites. The cleared areas would be visible but not as visually prominent as exposed mining areas. Clearing and grading of the conveyor alignment also would result in a cut area on the west side of Grouse Ridge. Subsequent to completion of mining on the Lower Site, the asphalt, concrete, and aggregate processing facilities would be constructed on the site. Construction itself would not generate significant visual impacts. It is possible that additional sources of light would be used on the Lower Site during construction of the processing facilities, which could increase lighting levels in the area on a short-term basis.

12.2.1.3 Alternative 3–Lower and Upper Sites - Exits 34 and 38

Under Alternative 3, visual conditions during phased clearing of the Lower and Upper Sites would be similar to conditions under Alternative 2. However, clearing and grading of the conveyor alignment would not occur. Construction of the aggregate processing facility on the Upper Site could require lighting.

12.2.1.4 Alternative 4–Upper Site Only (Exit 38)

Under Alternative 4, no construction impacts would occur on the Lower Site. Construction impacts on the Upper Site would be similar to those under Alternative 2, although clearing and grading of the conveyor alignment would not occur. Overall, construction impacts would be less than under Alternative 2.

12.2.2 Operation Impacts

12.2.2.1 Alternative 1–No Action

Under Alternative 1, visual conditions of the sites would not change from existing conditions. Conversion of the sites to another allowed land use could result in some changes to the visual conditions of the sites. As forest harvesting on the sites is implemented in the future, clearcut conditions on portions of the Lower and Upper Sites would be visible from portions of the surrounding area. Light and glare conditions on the sites would not change.

12.2.2.2 Alternative 2–Proposal: Lower and Upper Sites Mining - Exit 34

Aesthetics

Development of the Proposal would temporarily convert approximately 260 acres of the 578-acre Upper Site and approximately 40 acres of the 115-acre Lower Site from existing forest production land to sand and gravel mining and processing use. The proposed mining activity would result in the removal of existing trees and exposure of sand and gravel resources within the proposed mining areas. The Lower Site also would include establishment of approximately 50-foot-high surge piles and possibly approximately 50-foot-high concrete and asphalt processing plants. A conveyor between the Lower and Upper Sites would be built.

The level of anticipated visual impact can be described as high, medium, low, and zero. High impact consists of views where a large portion of the mining activity would be visible and the existing character of the view would be changed. Medium impact consists of views where some view of the mining activity would be visible, but the existing character of the view is not anticipated to change. Low impact would afford only a glimpse of the mining activity. Zero impact would afford no view of the mining activity.

Some visual simulations of the conveyor alignment portray the conveyor in a red color in order to clearly depict its location. Cadman, Inc., however, describes the conveyor as being covered with a non-reflective metal cap to blend in with the tree canopy. These simulations offer a worst-case scenario analysis.

Views to the Sites. Depending on the viewpoint, all, a portion of, or none of the proposed mining and processing areas would be visible. As explained above in Section 12-1, Existing Conditions, views depicting the sites were chosen to represent primary viewer groups.

The view from near the summit of Mount Si during Phase 10 of the proposed project is illustrated in Figure 12-2. Proposed mining areas, cleared area for the conveyor alignment (including conveyor, water

pipeline and maintenance roadway), and a portion of the maintenance road outside of the conveyor alignment would be clearly visible from the summit of Mount Si, with the extent of mined area increasing as mining progresses. During Phase 1, the mining excavation and surge pile on the Lower Site and the conveyor alignment between the Lower and Upper Sites would be visible. The floor and sidewalls of the Lower Site mining area would be exposed and highly visible. By Phase 6, additional surge piles and the concrete facility would be visible on the Lower Site, as would the exposed floor of a portion of the Upper Site mining area. However, by Phase 6, vegetation would likely have become established on the sidewalls of the Lower Site mining area and on the edges of the conveyor alignment, lessening the visual prominence of that portion of the mining activity.

Mining on the western portion of the Upper Site would be visible by Phase 6, with a portion of the pit floor most visually prominent. At Phase 10 (Figure 12-2), visual conditions at the Lower Site would be similar to that during Phase 6. The extent of observable mined area on the Upper Site would be substantial during Phase 10. However, with the proposed phased reclamation, the total amount of exposed mine area would be similar to the amount exposed during Phase 6.

Overall, the majority of proposed mining activities would be visible from the summit of Mount Si. The mining area on the Lower Site would appear as a continuation of existing built features in the area, including commercial and residential development and I-90. The mining area on the Upper Site would create a relatively large cleared area in a currently undeveloped forest area. As perceived from the summit, the majority of the proposed mining, conveyor alignment and processing facilities would be visible, and the existing view would be significantly altered. The level of visual impact from this viewpoint to the sites would be considered high.

From the Uplands, no view of mining areas on the Upper or Lower Sites would be available, with the mining areas on both sites being hidden by existing topography. Some distant partial views of the conveyor alignment would be afforded. The level of visual impact from this viewpoint would be considered low.

From the residences along SE Middle Fork Road and SE Lake Dorothy Road, a slight lowering of the northern rim of Grouse Ridge would be visible by Phase 6, with some additional lowering of the northern rim of Grouse Ridge visible by Phase 10. This lowering would slightly increase the visibility of Mount Washington in the background. The level of visual impact from this viewpoint would be considered medium.

From the second floor of the Hahn Residence (representative of views from homes north of the Lower Site, across SE 144th Street), views to the Lower Site mining area would be limited to a glimpse of the southern sidewall and portion of the conveyor alignment (Figure 12-3). With the establishment of vegetation on the sidewalls, views of mining on the

Lower Site would be lessened, although the view of a portion of the conveyor alignment would remain. As shown in Figure 12-3, the majority of the Lower Site mining area would be hidden by existing vegetation, and all of the Upper Site mining area would be hidden by existing topography. Considering the screening provided by existing topography and vegetation, the level of visual impact from this viewpoint would be considered low.

From SE North Bend Way, the Lower Site mining area would be hidden by existing vegetation and the Upper Site mining area would be hidden by existing topography. The cleared area for the conveyor alignment, the conveyor, and a portion of the maintenance road outside of the conveyor alignment would be visible. The level of visual impact from this viewpoint would be considered medium.

From eastbound I-90, the proposed mining area on the Lower Site would be hidden by existing topography. The cleared area associated with the conveyor alignment and the conveyor traversing the western face of Grouse Ridge would be visible. The level of visual impact from this viewpoint would be considered medium.

At the intersection of 153rd Street and 470th Place SE, only small portions of the mining areas on the Lower and Upper Sites would be within the angle of view from this location, and proposed mining activity on both sites would be hidden by existing topography. A portion of the clearing associated with the conveyor alignment, the conveyor alignment, and the conveyor would be visible. The level of visual impact from this viewpoint would be considered medium.

From westbound I-90, the majority of the Lower Site mining area would be hidden by existing vegetation along the north side of the interstate. A glimpse of the northern sidewall would be visible from this viewpoint. With establishment of vegetation on the sidewall by Phase 6, the view of the mining area would be softened. The level of visual impact from this viewpoint would be considered low.

From the Iron Horse Trail viewpoint, there would be no view of mining activity on either the Upper or Lower Site. The mining area on the Lower Site is hidden by existing vegetation, and the mining area on the Upper Site is outside the angle of view. The level of visual impact from this viewpoint would be considered zero.

Two figures show the view of proposed mining areas from the Lu residence (Figures 12-4 and 12-5). From the second floor of the main residence, a portion of the southern sidewall and a portion of the conveyor would be clearly visible (Figure 12-4). Figure 12-5 illustrates that from the grounds of the Lu residence, mining areas on both sites would be completely hidden behind existing topography or vegetation. The clearing associated with the conveyor alignment and the conveyor would be visible, although the character of the view would not be significantly changed. The level of visual impact from this viewpoint would be considered medium.

A representative view of proposed mining activity from the Lu residence (Viewpoint 12) is shown in Figure 12-6. At the end of Phase 1, the majority of the pit floor and southern sidewall would be visible. By Phase 6, the processing facilities and the surge pile would also be visible. Also by Phase 6, vegetation would be established on the south sidewall, somewhat minimizing the visual impact. (During winter, the view to the Lower Site would be greater than depicted due to loss of deciduous vegetation.) Overall, the view from the meditation hut at the Lu residence would be significantly altered from existing conditions. The level of visual impact from this viewpoint would be considered high.

From westbound I-90, east of the Upper Site, direct views to the Upper Site mining area would be screened by topography and vegetation. However, the clearing of vegetation on the Upper Site by Phase 6 would result in a slight thinning and reduction in tree height along the southern edge of Grouse Ridge. No view of the Lower Site is afforded from this location. The level of visual impact from this viewpoint would be considered low.

From the Iron Horse Trail, south and east of the Upper Site, direct views of the Upper Site mining area would be screened by topography and vegetation. The clearing of vegetation on the Upper Site by Phase 6 would result in a thinning and reduction in tree height along the southern edge of Grouse Ridge. No view of the Lower Site is afforded from this location. The level of visual impact from this viewpoint is considered low.

The view from near the summit of Mailbox Peak during Phase 10 is illustrated in Figure 12-7. During Phase 10, the entire Upper Site mining area and the upper portion of the conveyor alignment would be visible. The majority of the Upper Site would be in vegetation, although the eastern quarter and an east/west roadway would be bare ground. As perceived from the summit, the majority of the mining area on the Upper Site would be visible, and the existing view would be significantly altered. The level of visual impact from this viewpoint would be considered high.

From SE 144th Street (Viewpoint 16), no views of mining areas on the Upper or Lower Sites would be available. From this viewpoint (Figure 12-8), a straight-on view of the conveyor alignment along the western slope of Grouse Ridge would be afforded and clearing associated with the conveyor, and portions of the maintenance road outside of the conveyor alignment would be visible following clearing during Phase 1. (Figure 12-8 shows the view during Phase 6.) Although visible, the conveyor alignment would encompass a small portion of the view and the conveyor would be enclosed in a low-reflective natural colored material to minimize visibility and glare. The level of visual impact from this viewpoint would be considered medium.

From the Snoqualmie Point Overlook (Viewpoint 17) a distant view of the eastern sidewall of the Lower Site and the cleared area associated with

the conveyor alignment would be afforded. Views to the majority of the mined area on the Lower Site, the processing facilities on the Lower Site, and the mined area on the Upper Site would be blocked by existing topography. Because of the small amount of visible mining area and distance between the sites and the viewpoint, the level of visual impact from this viewpoint would be considered low.

Visual impacts would be reduced as newly planted vegetation grows. A series of visual simulations approximating the screening effect of vegetation at various stages of growth from the Lu Residence 1 (Viewpoint 10), 2 (Viewpoint 11), and 3 (Viewpoint 12) are illustrated in Appendix K. One of these simulations (Figure 12-9) shows the effect of vegetation growth on views of the Lower Site from Lu residence 1. By year 10 of the Proposal, the screening berm and southern sidewall would appear as natural area and only a small portion of the processing plant would be visible. In contrast, at year 1, portions of the northern screening berm, southern sidewall, the conveyor within the Lower Site mining area, and a processing plant would be visible from Lu Residence 1.

Light and Glare

Light Conditions. The Proposal would result in new light sources on both the Upper and Lower Sites and introduce lighting into an area that currently has very low light levels. The new fixed light sources anticipated for the Lower Site would include lighting on the concrete and asphalt plant buildings, lighting on the aggregate processing facility, lighting on conveyors within the mining area (lighting along the conveyor between the Upper and Lower Site is not proposed), and pole-mounted security lighting. Direct impacts related to new lighting would be minimized by locating all light sources below the top of the mining excavation rim and by directing light down on to the area to be lit, not in a sideways manner that can result in light directly reaching offsite properties.

To obtain light level measurements representative of conditions within the mining area of the Proposal, light levels at the existing Cadman Sky River facility in Monroe were measured on May 9, 2001. The measurements were taken at ground level at various distances from the light source. Lighting at the Monroe site is minimal, as there is not a large quantity of luminaires installed. (Lighting at the Proposal sites is expected to be similar.) The existing lighting provides general levels of illumination at the main building, stockpile operations and excavation site. Lighting is generally contained within the location that is being illuminated. Lighting equipment consists of semi-cutoff cobra head luminaires for parking/roadway illumination, building-mounted wall packs for area lighting, and floodlighting for the site operational lighting. All of the equipment used high pressure sodium lamps. The results of the light level measurements are provided in Table 12-2.

Table 12-2
Light Level Measurements
at Sky River Facility (Monroe, Washington)

Location	Light Source	Light Level (foot-candle range)
Monroe Plant	Parking Lot	0.0 to 1.2
Monroe Plant	Building Area Lighting	0.4 to 7.0
Monroe Plant	Operations Area Lighting	0.5 to 15.0

Comparing light levels anticipated within the Lower Site to existing levels in the vicinity of the sites indicates that light levels would be greater than the rural residential and forest areas and less than the commercial area along 468th Avenue SE. Parking lot light levels on the Lower Site generally would be less than those at the Auto Truck Plaza or 76 Station and would be similar to those associated with street lighting along SE Middle Fork Road and SE 146th Street. Light levels associated with building area lighting would be similar to and slightly higher than the existing parking lot lighting at the Auto Truck Plaza and 76 Station. Light levels within the main operations area would be greater than the existing parking lots at the Auto Truck Plaza and 76 Station, and significantly less than those associated with the pump islands. As mentioned previously, the lighting levels indicated are those adjacent to the source. Intervening topography and implementation of lighting techniques to minimize light glare would minimize light levels to area properties.

Direct impacts related to new lighting would be minimized by locating all light sources below the top of the mining excavation rim and by directing light down on to the area to be lit, not in a sideways manner that can result in light directly reaching offsite properties.

Because no processing facilities would be located on the Upper Site, the number of fixed lighting sources would be less than anticipated for the Lower Site and would primarily be located on conveyors and loaders within the mining area.

Mobile sources of light from vehicular equipment would increase on both the Upper and Lower Sites. Because the mobile sources of light would primarily be located at the floor of the mining areas, light from mobile sources would be anticipated to be contained within the mining areas. Light associated with offsite truck trips would increase, particularly during the winter when there are more hours of darkness. The increased light from trucks would be primarily limited to SE 146th Street and 468th Avenue SE from SE 146th Street to I-90.

With the features of the Proposal to limit direct light spillage to offsite properties, significant impacts to adjacent properties from fixed and mobile sources of light on the sites would not be anticipated. Because of the existing overall low level of light, establishment of new lighting sources in the area would produce an indirect “glow” of light that would

be visible from surrounding areas. The characteristics of the indirect "glow" of light would be anticipated to vary somewhat depending on atmospheric conditions. For example, during periods of low cloud cover and fog, the indirect "glow" of light would be reflected off of cloud cover and be more visible than during clear nights. However, because nighttime sky viewing occurs on clear nights, sensitivity to indirect glow by certain viewers could be higher during clear atmospheric conditions.

Glare Conditions. The Proposal would include the introduction of new facilities that would increase the potential for glare, including increased vehicle traffic on area roadways, establishment of fixed processing facilities, introduction of mobile equipment within the mining areas, and establishment of the conveyor between the Lower and Upper Sites. Because the processing facilities and mobile equipment would be located below the top of the mining area rim, significant impacts from these facilities are not anticipated. The proposed conveyor between the Lower and Upper Sites would be approximately 4 feet above the ground and enclosed in a low reflective material. By enclosing the conveyor, it can be located closer to existing trees, thereby further limiting glare potential. Glare from truck traffic using area roadways and I-90 would increase the overall amount of glare on these roadways. However, because truck traffic from the Proposal would be a small percentage of the overall traffic on these roadways, a significant increase in glare is not anticipated.

Dust and Steam

Proposed mining and processing activities on the Upper and Lower Sites would generate dust and steam that could be visible from adjacent and distant viewpoints. Dust would be generated on the both the Upper and Lower Sites by excavation, sorting and stockpiling of sand and gravel, and by truck and equipment movement on unpaved surfaces. Steam would be generated on the Lower Site as a byproduct of asphalt production. The level of dust and steam visibility would depend on weather and wind conditions; for example, the potential for visible dust would be greater during dry weather. Steam from the asphalt plant would likely be more visible during times of calm winds when there would less steam dispersion. The presence of a steam plume could present an industrial character to the view.

Smoke

If woody debris is burned during clearing for mining, smoke would be generated and could be seen from area viewpoints. The amount of smoke would be similar to that under typical forestry activities and short-term in duration.

12.2.2.3 Alternative 2A–Upper Site Mining and Limited Lower Site Mining - Exit 34

The view from near the summit of Mount Si during Phase 10 of Alternative 2A is shown in Figure 12-10. The view from this location

would be similar to that under Alternative 2; however, the area of visibly cleared ground would be reduced by approximately 5 percent. As under Alternative 2, the majority of proposed mining activities on the Lower Site would be visible from this location. Visual conditions on the Upper Site would be the same impact as under Alternative 2. As under Alternative 2, the clearing associated with the conveyor alignment would be visible. The level of visual impact from this Mount Si viewpoint would be somewhat less than under Alternative 2 but would still be considered high.

From westbound I-90, the majority of the Lower Site would be hidden by existing vegetation along the north side of the interstate, as would be similar under Alternative 2. A somewhat greater view of the northern sidewall would be afforded. As under Alternative 2, the level of visual impact from this viewpoint would be considered low.

From the second story of the Lu residence, a smaller portion of the southern sidewall and a section of the conveyor within the Lower Site mining area would be visible compared to Alternative 2. However, as under Alternative 2, the visual impact from this viewpoint under the Lower Site Option would be considered medium.

From the Lu residence (Viewpoint 12), the southern sidewall would be clearly visible, as would be similar under Alternative 2. The amount of excavation pit floor area visible from the Lu residence (Viewpoint 12) would be less than under Alternative 2. Although the amount of disturbed area visible under Alternative 2A would be less than under Alternative 2, the overall level of visual impact from the Lu residence (Viewpoint 12) would be considered high.

12.2.2.4 Alternative 3–Lower and Upper Sites (Exits 34 and 38)

Under Alternative 3, visual conditions during early phases of the proposed project (prior to establishment of the processing facilities) would be the same as under Alternative 2. Mined areas would be visible from some locations. New lighting could be required on the roadway from Exit 38; new light could be visible from the south. Compared to Alternative 2, relocation of the aggregate processing facility to the Upper Site would not significantly change the view to the Lower and Upper Sites from most areas.

The Mount Si and Lu residence viewpoints would be the most changed when compared to Alternative 2. As shown by Figure 12-11, the view of the aggregate processing facility would be shifted from the Lower Site to the Upper Site and the conveyor would not be built. In addition, the aggregate facility would be located in the far eastern corner of the mining area on the Upper Site, thus moving the aggregate processing facility farther from this viewpoint. As with Alternative 2, the level of visual impact from this viewpoint would be considered high. From the Lu residence (Figure 12-12), the surge pile that would be visible under

Alternative 2 would be absent. However, the level of visual impact from this viewpoint would still be considered medium.

Relocation of the aggregate processing facility to the Upper Site would increase the amount of lighting on the Upper Site and reduce lighting on the Lower Site. As with Alternative 2, lighting would use low pressure sodium bulbs and full cutoff luminaries to minimize lighting impacts on adjacent properties. Lighting impacts on the nighttime sky would be similar to Alternative 2.

From the Iron Horse Trail 2 (Viewpoint 14), the view of the Upper Site would be similar to that under Alternative 2. However, by Phase 6, the level of thinning and reduction in tree height along the southern edge of Grouse Ridge would be less than under Alternative 2. As under Alternative 2, the level of visual impact from this viewpoint would be low.

From the Lu residence (Viewpoint 12) during Phase 6, the processing facility on the Upper Site would not be visible and the amount of visible mining area would be slightly less than under Alternative 3 (Figure 12-13). However, because of the extent of visible mining area, the level of visual impact from this viewpoint would still be considered high.

12.2.2.5 Alternative 3A–Upper Site Mining and Limited Lower Site Mining - Exits 34 and 38

Impacts would be similar to those under Alternative 3, although the impacts would be slightly less on the Lower Site.

12.2.2.6 Alternative 4–Upper Site Mining (Exit 38)

Under Alternative 4, no clearing of existing vegetation, mining, or establishment of processing facilities would occur on the Lower Site, and the Lower Site would remain in its existing forestry use. In the future, timber harvesting would occur on the site, which would affect views from certain viewpoints. However, timber harvesting on the Lower Site would occur over a significantly shorter period than mining and processing under the Proposal, and no processing facilities or surge piles would be established. Figure 12-14 illustrates the view of Alternative 4 from Mount Si. As shown by Figure 12-14, no change in visual conditions on the Lower Site would occur, and visual conditions on the Upper Site would be similar to Alternative 2. Although the overall visual impacts would be somewhat less than under Alternative 2, the level of visual impact from this viewpoint would be considered high.

Elimination of mining on the Lower Site and elimination of processing facilities entirely would result in lower levels of light than under Alternative 2. Impacts on nighttime sky viewing would be less than under Alternative 2.

12.2.3 Cumulative Impacts

The Homestead Valley Mine immediately south of the Upper Site, the King County Public Works gravel storage yard on SE Middle Ford Road, and the Old Stone Quarry on SE North Bend Way are the only active mining operations in the immediate vicinity. The Snoqualmie Sand and Gravel Mine is also located in the general vicinity, approximately 5 miles to the northwest. Because the location of mining operations is largely based on suitability of site resources and land use designations, the addition of the proposed mining operation to the area is not anticipated to increase pressure for additional mining operations in the area. The Proposal is not anticipated to increase the potential for visual impacts from additional mining operations in the vicinity.

12.3 Mitigation Measures

The mining plan has been designed to minimize visual impacts to the extent practical. Measures included in the proposed mining plan to minimize visual impacts include the following:

- Mining would be phased. Upon completion of mining within an individual phase, the mined area would be reclaimed, thus limiting the amount of mining activity during any given year.
- A naturally vegetated buffer would be retained around the perimeter of the Lower and Upper Sites to buffer nearby residential uses from mining and processing activities.
- Mining on the Upper Site would be conducted below the existing rim of Grouse Ridge to minimize views to mining.
- Vegetated view screening berms would be provided along portions of the northern, eastern, and southern sides of the mining area on the Lower Site.

The ultimate reclamation of the Upper and Lower Sites, following the conclusion of mining activities, would include the following:

- Pre-mining site preparation, including use of onsite overburden material
- Slope stabilization and erosion control, including stormwater control and temporary erosion control measures such as hydroseeding and filter fence check dams
- Final contouring and topsoil placement
- Revegetation with trees

The proposed conveyor between the Lower and Upper Sites would be enclosed in a low-reflective, natural-colored material to minimize visual and glare impacts.

To further reduce lighting levels from the Proposal, the following additional mitigation measures are proposed as a result of this environmental analysis:

- Lighting should meet the specifications of the U.S. National Parks Service Interim Design Guidelines for Outdoor Lighting.
- Building lighting should be located high on the structures and include forward throw optics to direct lighting away from the sides of the buildings and onto the ground.
- Mining area lighting should be independently mounted (not directly attached to equipment) to allow for a more downward throw of light to further limit the potential for direct light to reach offsite areas.

12.4 Significant Unavoidable Adverse Impacts

The proposed phased mining and reclamation plans have been designed to minimize visual impacts. However, mining activity and processing facilities would represent a significant unavoidable impact to some viewpoints in the vicinity, particularly higher elevation recreation areas (Mount Si Natural Resources Conservation Area) under Alternatives 2, 3, and 4, and the Lu residence (Viewpoint 12) under Alternatives 2 and 3. In addition, clearing associated with the conveyor alignment would represent a significant unavoidable impact to some viewpoints under Alternative 2. Visual impacts of the mining operations would exist until mining on the sites ceased and reclamation activities were completed. However, some of the visual impacts would be reduced prior to reclamation as a result of revegetation plans that would be implemented in the early phases of the project. The proposed project could increase the level of light in an area that currently contains low light levels.